This powerpoint covers the following topics:
Participants will be able to:
1. Share basic information about Active Learning with someone else
2. Identify the role of play in learning

It will take approximately 45-60 minutes to present.
As you introduce the session, encourage participants to go to the Active Learning Space website on their phone, tablet or computer. The url is www.activelearningspace.org

Would you like to learn about Dr. Nielsen’s FIELA Curriculum and how it can be used to develop programming?

How about getting ideas for how to organize your classroom and your student’s daily and weekly schedule?

Would you like to see examples of how to develop activities and environments to teach both general and expanded core curriculum, or work on specific motor skills?

This presentation utilizes content on Active Learning Space, a collaborative website developed by Penrickton Center for Blind Children, Perkins School for the Blind and Texas School for the Blind & Visually Impaired.
What You Will Learn

When you have completed this session you should be able to:

Suggest activities and environments that match the learner’s developmental level, needs and preferences and can help a learner to develop motor skills such as grasp, reach, balance, independent sitting, standing, and walking using Active Learning equipment and activities.
Section 4

Developing Motor Skills
From neuroscientist Daniel Wolpert:

*We have a brain for one reason and one reason only -- that’s to produce adaptable and complex movements. Movement is the only way we have affecting the world around us... I believe that to understand movement is to understand the whole brain. And therefore it’s important to remember when you are studying memory, cognition, sensory processing, they’re there for a reason, and that reason is action.*

From neurologist and author Oliver Sacks:

*Much more of the brain is devoted to movement than to language. Language is only a little thing sitting on top of this huge ocean of movement.*

Share these quotes with participants and ask for their thoughts. Do they agree or disagree? Why?
Active Learning is all about being active.
There are many different motor skills that develop in a predictable sequence.
Motor development occurs naturally from:

- Reflexive to intentional movement
- Top (head) to bottom (toe) movement
- Near (center body) to far (fingers and toes) movement
- Gross to fine movement
All children need opportunities to practice motor skills thousands of times before these skills become automatic. As they learn these skills, they can interact with people, places and things better. This is how they come to understand about the world and how things work. They gain confidence, too, in their own ability to impact the world around them.
Most children with significant developmental delays need systematic support to achieve the necessary motor skills that will help them to grow in all areas including communication, cognition, social and emotional areas.
These are examples of gross and fine motor (movement) skills.
What are some other gross movement skills?
What are some other fine movement skills?
First of all we need to remember that very young infants who are typically developing have a reflexive grasp. It takes approximately 1 year for a typically developing child to learn how to intentionally pick up and hold objects securely in his hands.

Many children with significant developmental delays lack the ability to grasp objects and are unable to manipulate objects in any way.

There are specific Active Learning activities and environments to support a child in learning to grasp and release things intentionally. This is true even if the learner is currently unable to open and close their hand. **This handout is available for download and in the supplemental handouts. You may want to share copies with your participants.**
Developing Motor Skills

Hand use is incredibly important, and not every child will gain full use of their hands.
In Active Learning we want every child to make progress towards grasping, reaching, batting, banging, moving and object from one hand to another, and other hand skills if they can.
Visit Grasping under the Implementation Tab on Active Learning Space and view some of the videos you will see there.

There are 10 short videos on this page. Each runs from 2-5 minutes. Divide your group into pairs and ask them to review one or more of the videos and share something they noticed about the activity and grasp.

Hand use is incredibly important, and not every child will gain full use of their hands. In Active Learning we want every child to make progress towards grasping, reaching, batting, banging, moving and object from one hand to another, and other hand skills if they can.
Visit Grasping under the Implementation Tab on Active Learning Space and view some of the videos you will see there.

Arm Movements with Slinky on a Resonance Board
Did they notice how his hands opened from time to time during this activity?

Interacting with an Outdoor Activity Wall
Do they think the movements were reflexive or intentional?

Rice Tray with Water
This child has been labeled as being tactually defensive. How do you think the design of this activity helped him to have this icky sticky stuff on his hands? What is motivating to him? How does having something icky on his hands help him practice opening and closing his hand?
**Practicing Grasping Skills in a Little Room**
Do you think this child has intentional grasping yet? Why does this environment design help him to develop a grasp? What other skill is the child working on? (Reaching)

**Massager on Hand**
Do you think the student is motivated to interact with the vibrator? Do you think he intentionally opens his thumb and forefinger to try to grasp the vibrator?

**Exploring Kinetic Sand on a Mirror Tray**
What is the motivator for Zain? (sound the ball makes when it drops) He clearly likes the balls, so why does the adult add other materials? (easier to grasp, perhaps has learned most of what he can learn from just playing with the balls – Dynamic Learning Circle)

**Drumming**
What is the motivator in this activity? How does the activity work on grasping? Do you think this is the primary focus of this activity? (Hint: adult-child interaction – probably working on social and emotional development. He stays with the teacher and plays along side her)

**Rain Stick and Steel Drum**
What hand skill might Javarius lack or is just beginning to develop? (wrist rotation) What do you think of the way the adult interacts with the child? (For example: She doesn’t try to “show him” how to rotate his wrist to make the rainstick work. She introduces a new action by rolling the ball into the drum but doesn’t insist he try it when he goes back to just experimenting with dropping it.)
Developing Motor Skills

This is some of the information that Dr. Nielsen shares in her book, *The Comprehending Hand*, related to the development of grasp.

- hand to mouth
- hand to hand
- objects held in hand
- objects held in hand put to mouth
- losing objects
- objects transferred from one hand to the other
- reaching out for objects
- knocking objects on the table
- handling of objects
- throwing objects
- knocking two objects against each other
- pincer grasp -- for beginners
- pointing to objects
- taking objects
- putting objects inside each other
- building with objects
In Active Learning we start with what the child is currently doing. So when working on activities to develop grasping, we start with helping the child to open up his fisted hand.

Scratching or raking using a Scratch Board, bins of sand, beans, or rice, or playing in a Little Room with graspable objects are all activities that can help in developing grasping.
Developing Motor Skills

Once the hands begin to open just a little, materials that can allow for fingers to become tangled in them can be used. For example:

• Ribbon curls
• Chains with finger-sized links
• Bead necklaces (wooden, glass, metal, etc.)
• Fringed curtain ties
• Shoe-strings
• Wigs and hair pieces
• Slinkys
At first you may see your student latching onto an object and not letting go intentionally. This is a typical step towards developing intentionality in grasping and letting go of objects. Make sure the items you provide are graspable and that are the right size for the learner’s hands – not too small and not too big.
Developing Motor Skills

Developing the ability to intentionally grasp an object and then release it is very important. This allows for more detailed exploration and experimentation that can allow for objects to be transferred from hand to hand, repositioned, and offered to a partner.
Developing Motor Skills

Here are more ideas:
- Explore trays, wooden board or cardboards wrapped in or strung with elastic
- Strum stringed musical instruments
- Play with dowel rods in a tray
- Explore objects on a Position Board with short cords.
- Explore venetian blinds
- Play with bowl of cooked spaghetti

Here are more ideas for working on grasping:
- Explore trays, wooden board or cardboards wrapped in or strung with elastic
- Strum stringed musical instruments
- Play with dowel rods in a tray
- Explore objects on a Position Board with short cords.
- Explore venetian blinds
- Play with bowl of cooked spaghetti
Developing Motor Skills

You can also use perceptualizing aids that include:

• **SPG (scratch, position, grasp) Boards**
• **Table top mobiles**
• **Little Room**
Improving overall finger strength is important. Provide many opportunities for the learner to use fingers throughout the day at his or her level of development. The development of finger strength plays into later developing skills like producing braille, working with tools, being able to feed yourself and so much more.

Suggest that teams visit with both the OT and their teacher of students with visual impairments who may be able to suggest a wide range of activities to improve finger strength.
Dr. Nielsen in *The Comprehending Hand* suggests these activities to work on finger strength:

These are just a few examples of what can be found on the Active Learning Space website at [http://www.activelearningspace.org/implementation/motor-development/grasping](http://www.activelearningspace.org/implementation/motor-development/grasping).

- Crumpling large and small pieces of paper
- Squeezing an ear-syringe or basting syringe
- Zipping zippers
- Flattening balls of clay with hands, fists or a flat piece of wood
- Turning keys in locks
- Rolling out balls of clay with a pastry roller
- Pressing on push-buttons (which can give different sounds)
- Taking tops off containers
- Making holes in lumps of clay with fingers
- Putting matches, different kinds of sticks, in clay

Take some time to discuss this list with your participants.
If you want to learn more about hand development we encourage you to read The Comprehending Hand by Dr. Lilli Nielsen or you might want to look at the September 2018 Active Learning Study Group Webinar. In this video Patty Obrzut and Jessica McCavit who are both OTs share information about hand development through Active Learning.

This webinar runs about 1 hour so you will probably not want to show it during your training.
Developing Motor Skills

Reaching
Grasping and reaching develop together. Children who are visually impaired or have motor problems need systematic support to develop the ability to reach.
First they have to be aware there is something they want to make contact with and then they have to coordinate their muscles to reach for it.
There are many ways to work on the skill of reaching using various perceptualizing aids.

You can learn more about these various pieces of equipment and how they can be used by visiting the Equipment tab on the Active Learning Space website at http://www.activelearningspace.org/equipment/equipment-overview or in the “Equipment” powerpoint.
Typically developing children reach for objects at 3-4 months.

Children with blindness often are 10-12 months old before they achieve this ability even without motor problems.

Some children who are blind develop a stereotyped motor behavior focused on their own body, instead of developing reaching behavior.
Reach involves both motor skills and spatial awareness. Vision and hearing play an important role in developing reach. Initially the child might only reach for things on his body. Later he may move his hand further away from this body to explore, if we provide enticing materials.

Spatial relationships are key to learning to reach effectively. This skill is also needed in orientation and mobility.
Little Rooms, Position Boards, Mobiles, and Echo Buckets are just a few devices that can help in developing the skill of reaching.
Developing Motor Skills

When working on reaching, be sure to:

• Select graspable materials
• Select things that produce interesting sounds, are tactually interesting or have interesting smell
• Select things that are visually interesting if there is usable vision
• For position boards start with objects on a short cord then lengthen cord so learner can bring it to his mouth.
• Safety is important. Pay attention to choking hazards.

When working on reaching, be sure to:

• Select graspable materials
• Select things that produce interesting sounds, are tactually interesting or have interesting smell
• Select things that are visually interesting (color, shine, pattern or lack of pattern) if the child has usable vision
• For position boards start with objects on a short cord and then lengthen cord so learner can bring it to his mouth or eyes.
• Remember safety is important. If the learner is bringing things to his mouth take care that he can’t break off something that would cause him to choke.
Developing Motor Skills

There are a variety of other materials and devices that have been developed to work on grasp and reach:

- Activity belt
- Buncher
- Echo Bucket
- Elastic Board
- Position Boards
- Vest, Activity Belt

As time allows you may want to show some of these pages to your participants.
Before you go further, take a look at this video and see how the Little Room helps Jack work on both reach (and grasp) as well as spatial orientation.

Jack in the Little Room

This video is approximately 8 minutes long.
Developing Motor Skills

Are you currently working on the skill of reaching with any of your students?

Have you used any of the following equipment?

If the student is blind or visually impaired, what do they need to keep in mind to motivate him to reach? (tactual and auditory feedback)

Are you currently working on the skill of reaching with any of your students?

Have you used any of the following equipment?

If the child is blind or visually impaired, what can help motivate him to reach for something?
Sitting
Learning to sit is an important milestone.
It involves strong core, head, and neck muscles.
It requires the ability to balance.
Vision can also play a role in developing sitting skills.
Though too much sitting is harmful for us, it is an important skill for children to achieve.

Developing Motor Skills

Sitting
Learning to sit is an important milestone.
It involves strong core, head, and neck muscles.
It requires the ability to balance.
Vision can also play a role in developing sitting skills.
Though too much sitting is harmful for us, it is an important skill for children to achieve.
Typically developing children take anywhere from 4 to 9 months learning to sit independently. For children with significant disabilities this can be a much longer process. Active Learning, because of its intensive focus on movement, can help work on this important skill outside of specific therapy time, increasing the practice time so necessary for the student.

There are specific pieces of Active Learning equipment that can help a student develop the skill of sitting unsupported. These two devices are the ones most often used:

- Support Bench (builds neck, shoulder, back muscles and allows for coordination of arms and legs)
- Essef Board (builds strength but also works on balance)
Some children may never achieve the ability to sit independently due to problems such as cerebral palsy, severe scoliosis, or spinal injury. However, supports can be provided to help them gain neck, shoulder and trunk strength so they need minimal supports to be upright.
Developing Motor Skills

Working on sitting activities:

- Prone on a Support Bench to increase core and shoulder muscle strength, improve head control - moving arms and legs.
- Supported sitting - bounce or rock on an ESSEF board, therapy ball or adult’s lap.
- Lying on back - reach up for objects overhead using a Little Room, Mobile, or Echo Bucket.
- Supported sitting - reach and clasp adult's hands to play hand games.

There are a few ideas at http://www.activelearningspace.org/implementation/motor-development/promoting-independent-sitting to show that working on sitting can be done in a variety of environments and activities. You may want to share this page with your participants.

Play in prone on a Support Bench to increase core and shoulder muscle strength and improve head control while moving arms and legs.
- In supported sitting bounce or rock on an ESSEF board, therapy ball or adult’s lap.
- Lying on the back, reach up for objects overhead using a Little Room, Mobile, or Echo Bucket
- In supported sitting reach and clasp adult's hands to play hand games or play with a position board.
Developing Motor Skills

Standing and Walking
The ability to independently stand and walk may not be attainable for all children. However most children will benefit if they have the opportunity to play in a variety of positions including standing. This can be done with the use of the HOPSA Dress.

Standing and Walking
The ability to independently stand and walk may not be attainable for all children. However most children will benefit if they have the opportunity to play in a variety of positions including standing. This can be done with the use of the HOPSA Dress.
Certain issues like paralysis, hip displacement, spinal injury or cerebral palsy can all affect a child’s ability to stand or walk.

Still we can help the learner to experience being in an upright position where arms and legs are free to move.

Before you go further, please watch this video of Sonya in a HOPSA Dress.
Take a moment as a large group to discuss the video. Be sure to point out that even though Sonya has hip displacement, her orthopedist was happy to see her use the HOPSA Dress.

We have heard a number of PTs object to the use of the HOPSA dress when a learner is not yet able to achieve head control. Yet many learners have used it that couldn’t initially hold their heads up and many of them became able to do this over time while playing in a HOPSA dress.

What thoughts do you have about seeing Sonya in the HOPSA Dress?  
What types of concerns do you or others you know have about using a HOPSA Dress?  
Did you know that a learner does not necessarily have to have the ability to hold his head up to be able to safely play in a HOPSA Dress?
A HOPSA Dress is a perceptualizing aid developed to help students learn to stand and walk.

It can be hung from a hook in the ceiling or used with a track that allows the student to move.
Developing Motor Skills

Benefits of using a HOPSA Dress include:
• Coordination of arms and legs
• Blood circulation
• Breathing
• Intestinal functioning
• Bronchial condition
• Muscle strength in core, head, neck and leg muscles
• Bone structure

In addition to learning to stand and walk the benefits of using a HOPSA Dress include:
• Coordination of arms and legs
• Blood circulation
• Breathing
• Intestinal functioning
• Bronchial condition
• Muscle strength in core, head, neck and leg muscles
• Bone structure
Using an ESSEF Board is another way to improve leg strength and coordination needed for standing and walking.

Here are just a few ideas:

• Standing on an ESSEF and holding a wall-mounted ladder to go up and down
• Swinging and pushing with legs against an ESSEF board
• Kicking on an ESSEF board with objects attached
• Jumping on an ESSEF board with assistance from adult
Though a Support Bench primarily helps to develop neck, shoulder and trunk muscles, it also allows for movement of both arms and legs in a pattern similar to crawling. It even comes with wheels so a learner can use arms and legs to move around.

Scooter boards can also work on leg and arm movement, but not as well as a Support Bench.
Any and all movement is important to learning and development.
It may start with a finger scratching at a shirt button, a reflexive or spastic random movement of arms and legs, or simply pushing with legs and feet to get to the corner of a crib.
We start from reflexive and work toward intentional movements.
We recognize that even in the womb as a fetus brings a hand to mouth or kicks against the uterine wall. Even at that early stage of development learning is taking place through movement.

Active Learning supports movement in every way.

The more a child moves the more he will learn.

The more he moves the more confidence he gains in his ability to interact with the world.

So get those kids MOVING!
Credits

This content was developed by Texas School for the Blind & Visually Impaired Outreach Program and may not be used without their express permission.

This content is based on the Active Learning Space website, collaboratively developed by Penrickton Center for Blind, Perkins School for the Blind and Texas School for the Blind and Visually Impaired. Special contributions of content and images of Active Learning instruction comes from Narbethong State Special School in Australia.

All content is based on the original work of Dr. Lilli Nielsen of Denmark. Our thanks to her family and the staff at Byhaesvskolen, Svendborg, Denmark for making her work available to educators world-wide.

Our special thanks to the children, parents, and educators who contributed photos illustrating the Active Learning approach at school and at home.

Additional funding was provided by the Texas Low Incidence Disabilities Network and Statewide Leadership Services for the Blind and Visually Impaired.

"This project is supported by the U.S. Department of Education, Office of Special Education Programs (OSEP). Opinions expressed herein are those of the authors and do not necessarily represent the position of the U.S. Department of Education."